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Attorney Docket No: 073600.P022 *Patent*

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of:

Ueno, et al.

Application No.: 09/479,267

Filed: January 6, 2000

For: SPIN VALVE MAGNETORESISTANCE SENSOR AND THIN FILM MAGNETIC HEAD

Examiner: Franklin D. Altman, III

Art Unit: 2652

APPEAL BRIEF Under 37 CFR §1.192

Box AF
Commissioner of Patents and Trademarks
Washington, D.C. 20231

Dear Sir:

Applicants (Appellant) hereby submit this Appeal Brief in triplicate pursuant to 37 C.F.R. § 1.192 in connection with the above-referenced application and respectfully request consideration by the Board of Patent Appeals and Interferences for allowance from a final decision by the Examiner. The Examiner's final decision was mailed as a Final Office Action on June 08, 2001 and rejected all claims (1-4). The Examiner also maintained that claims 1-4 stand rejected in an Advisory Action dated July 16, 2001 in response to Applicants' response after final office action dated July 6, 2001. Applicants also submit herewith a check in the amount of $310 as the fee for filing an Appeal Brief required by 37 C.F.R. § 1.17(c). Applicants submitted a Notice of Appeal on August 6, 2001. Please charge any additional amount due, or credit any overpayment, to deposit account 02-2666.

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I. REAL PARTY IN INTEREST

The real party in interest of Appellant is Read-Rite Corporation.

II. RELATED APPEALS AND INTERFERENCES

Appellant is unaware of any related appeals or interferences.

III. STATUS OF THE CLAIMS

Claims 1-4 are pending in the application. No claims have been allowed.

Claims 1-4 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Aoshima et al. (*Aoshima*) (U.S. Patent 6,046,892) in the Final Office Action mailed on June 08, 2001.

IV. STATUS OF AMENDMENTS

No amendments have been filed after receipt of the Final Office Action.

V. SUMMARY OF THE INVENTION

The present invention relates to a spin valve magnetoresistance sensor. The sensor is made up of layers (sometimes referred to as films) of different materials. Figure 1 in the application illustrates one embodiment. The layers are stacked up as follows: on top of 1 an insulating layer is 21 a first base film, 22 a second base film, 41 a nickel-iron film, 42 a cobalt-iron film, 5 a non-magnetic conducting layer, 6 a pinned magnetic layer, 7 an antiferromagnetic layer, 8 a protective layer, and 11 an alumina insulating layer. Layer 9 is a hard bias layer, and layer 10 is a conductive head. These are described in

more detail in the Applicants' specification on pages 10 and 11. What is to be appreciated is that the materials used in making the layers have two important characteristics. Each layer material has a composition and an orientation. The composition relates to the fundamental atomic elements in the film. Often, as in the Applicants' invention, the composition of elements naturally results in a crystalline structure that is a regular repeating arrangement of the elements. The orientation relates to the angle that such a crystal structure is situated at. For example, Applicants' claim 1 recites among other things that the second base layer 22 is an alloy NiFeX (X includes Cr, Nb, and Rh) and has a 111 orientation. It is further to be understood that composition and orientation are independent of each other, that is, a particular composition does not imply an orientation and a specific orientation does not imply a composition.

VI. ISSUES PRESENTED

The issue presented on appeal is whether claims 1-4 are unpatentable under 35 U.S.C. § 102(e) as being anticipated by *Aoshima* (U.S. Patent 6,046,892).

VII. GROUPING OF CLAIMS

Claims 1-4 stand or fall together.

VIII. ARGUMENT

Claim 1 is considered representative of all claims and so Applicants' arguments are directed to claim 1.

Applicants' claim 1 defines a film layer having a crystalline structure and a specific orientation. The primary cited reference, *Aoshima*, does not show this specific orientation, however the Examiner claims the orientation is inherent because of the structure. Applicants respectfully disagree.

1) Applicants' invention is not inherent in view of *Iwasaki*

The Final Office Action (page 2) states that *Aoshima* discloses a spin valve magnetoresistance sensor, with a substrate, base layers, etc. and made from the same materials as Applicants' claim 1. This is a stack up of material layers only and as such does not discuss other properties of the material, such as magnetic orientation, crystal orientation, etc. However, the Examiner states "the second base film having a face-centered cubic (fcc) structure and a (111) orientation {inherent from "NiFeCr24.3%(3)" in Figure 5}." (Emphasis added.) The Examiner in his own bracketed comment has implied through inherency that a film compound has a specific orientation. Applicants disagree with the inherency implication.

The Examiner does not find the Applicants' claim 1 limitation of structure and orientation explicitly in the single reference of *Aoshima*, and so *Iwasaki* is cited as disclosing "that NiFeCr has an fcc structure and 111 orientation (column 8, lines 32-36, Iwasaki et al)." (Emphasis added.) This is not correct. What *Iwasaki* shows is that if a metal film is disposed on top of a Co based amorphous film which is itself on top of an fcc magnetic film, that the underlying fcc magnetic film promotes the fcc (111) orientation of the metal film on top of the Co. (Iwasaki, column 8, lines 32-36 as cited by the Examiner.) This is analogous to saying that a first magnet with an exposed North

pole promotes a second magnet (brought close to it) to orient its South pole with the exposed North pole. This does not mean that inherently the second magnet on its own will orient this same way. Nor does it mean that if the second magnet happens to orient its South pole toward the first magnet that the first underlying magnet must have its North pole toward it.

"A crystal contains planes of atoms: these planes influence the properties and behavior of a material." Lawrence H. Van Vlack, *Elements of Materials Science and Engineering* 88-89 (6d 1989). The orientation of a crystal lattice structure is dependent on a variety of factors. These factors include energy states, external forces, whether the material is epitaxially grown, sputtered, when nucleation occurs, temperature, rate of cooling, etc., and the underlying surface on which it forms. What *Iwasaki* discloses is that given the outside force of another fcc magnetic film it will promote a fcc (111) orientation. This does not imply that a film simply by its composition will assume a specific orientation.

"To establish inherency, the extrinsic evidence must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.' " *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999)(citations omitted) (Emphasis added).

2) Applicants respectfully submit that the Examiner has confused structure with orientation

Applicants believe that there may be confusion between structure and orientation. The structure does not imply an orientation. What the Examiner is attempting to equate is an fcc structure with a 111 orientation. A face centered cubic (fcc), as is well-known, has 4 atoms per unit cell, six 1/2 atoms on each face, and eight 1/8 atoms at the corners. Additionally, the close-packed direction is <110>. Importantly, these structural characteristics are completely independent of any orientation.

Aoshima does not show, disclose, or suggest an fcc structure and 111 orientation. Nor does the *Iwasaki* reference disclose or suggest Applicants' claim 1. *Aoshima* discloses a layering of materials in Figure 5. The *Iwasaki* reference discloses a method for using a lower film to promote an orientation of an upper film. It does not teach that if the upper film has this orientation, then the lower film must necessarily have a specific orientation. "In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art." *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990) (emphasis in original). The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. *In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993). (Emphasis added.)

3) Applicants' invention does not assert the presence of unclaimed extra structure

In the Final Office Action (page 3) there is an inference that, "Applicant asserts the presence of unclaimed extra structure, Aoshima's layer 23 having an face-centered cubic structure". Applicants disagree and reference *Aoshima* column 5, lines 5-12 wherein *Aoshima* discloses this structure. Applicants have not asserted the presence of an unclaimed extra structure. As in the original response to the first Office Action, Applicants are simply pointing out that Aoshima's layer 23 is being confused with Applicants' NiFeX second base film. The two elements, however, are not the same.

4) Applicants' invention does not preclude practicing prior art

As for the contention that allowing the "disputed claim would allow the patentee to exclude the public from practicing the prior art ..." it is respectfully submitted that the present claims do not encompass any subject matter within the prior art. The reason why is because *Aoshima* does not disclose the Applicants' claim 1 limitation either explicitly or inherently as explained above in the discussion on the distinction between structure and orientation.

5) Applicants' claim 1 is not directed to atomic percentage

In the Advisory Action (page 2) it is asserted that "it is the anticipation of *Aoshima* NiFeCr second base layer of identical atomic percentage of Cr, that Applicant is attempting to overcome." This is simply not correct. This is a wrong premise by the Examiner. What the Applicants disclose in claim 1 is not an atomic percentage but that there is a compound with a specific orientation.

Applicants respectfully submit that the appealed claims in this application are patentable, and request that the Board of Patent Appeals and Interferences direct allowance of rejected claims 1-4.

This brief is submitted in triplicate, along with a check for $300.00 to cover the appeal fee for one other than a small entity as specified in 35 C.F.R. §1.17(f).

Respectfully submitted,

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Date: 10/29, 2001

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FIRST CLASS CERTIFICATE OF MAILING
(37 C.F.R. § 1.8(a))

I hereby certify that the foregoing Appeal Brief, together with two copies thereof, and check in the amount of $300.00 are being deposited with the United States Postal Service as first class mail with sufficient postage in an envelope addressed to BOX AF, Assistant Commissioner for Patents, Washington, D.C. 20231 on October 29, 2001.

Vivian Y. Buijten
Name of Person Mailing Correspondence

Signature

10/29/01
Date

IX. APPENDIX

The claims involved in this appeal (all pending claims) are as follows:

1. A spin valve magnetoresistance sensor, comprising:

a base layer layered on top of a substrate, the base layer including a first base film having a nonmagnetic metal and a second base film formed on top of the first base film, the second base film having an alloy represented by NiFeX, wherein X includes one of Cr, Nb and Rh, the second base film having a face-centered cubic (fcc) structure and a (111) orientation;

a pair of magnetic layers enclosing a nonmagnetic layer layered on top of the base layer; and

an antiferromagnetic layer adjacent to one of the pair of magnetic layers.

2. The spin valve magnetoresistance sensor described in claim 1 wherein a film thickness of the second base file is within a range of 20 to 100Å.

3. The spin valve magnetoresistance sensor of claim 1 wherein X is Cr, wherein a content of Cr in the second base film is within a range of 20 to 50 at%.

4. The spin valve magnetoresistance sensor of claim 1 wherein the spin valve magnetoresistance sensor is included in a thin film magnetic head.